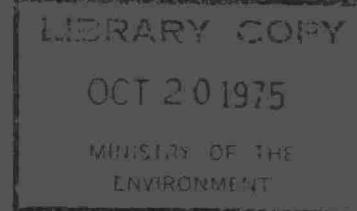


OPERATING SUMMARY

TD
227
K56
K56
1974
MOE
c.1
a aa

TOWNSHIP OF
KINGSTON
WATER POLLUTION CONTROL PLANT



Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca



Ontario

MINISTRY OF THE ENVIRONMENT

MINISTER

Honourable William G. Newman

DEPUTY MINISTER

E. Biggs

ASSISTANT DEPUTY MINISTER
REGIONAL OPERATIONS
J. Barr

REGIONAL OPERATIONS DIVISION

DIRECTOR, SOUTHEASTERN REGION
C. E. McIntyre

MANAGER, UTILITY OPERATIONS
A. Symmonds



Environment Ontario

Laboratory Library

125 Resources Rd.

Etobicoke, Ontario M9P 3V6

Canada

KINGSTON TWP.
WATER POLLUTION CONTROL PLANT

operated for

THE TOWNSHIP OF KINGSTON

by the

MINISTRY OF THE ENVIRONMENT

1974 ANNUAL OPERATING SUMMARY

prepared by

Plant Performance Unit

TECHNICAL SERVICES BRANCH

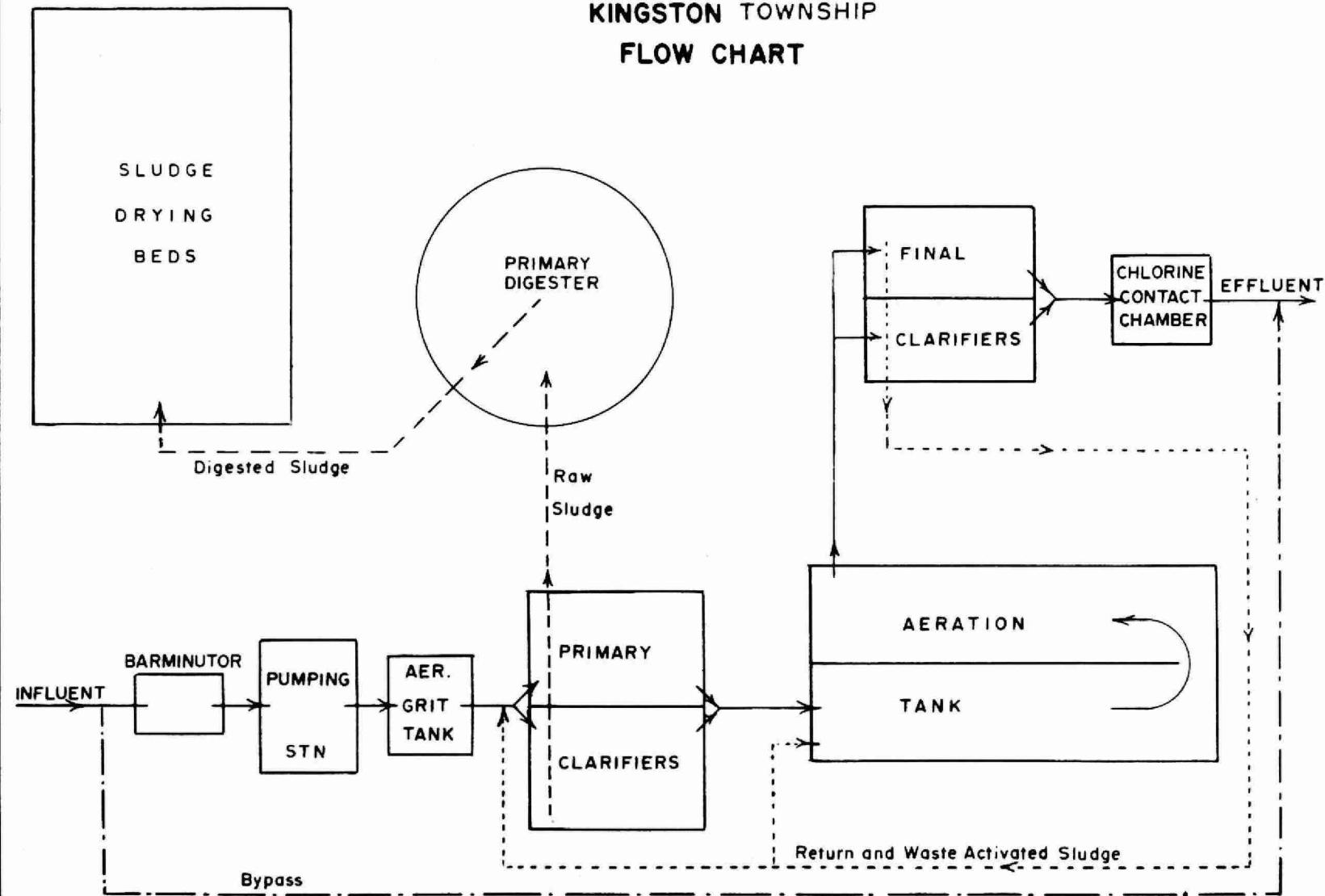
T. Cross, Director

TD
227
KS6
KS6
1974
MOE
atgm

CONTENTS

Title Page	1
Flow Diagram	4
Design Data	5
Operating Cost	6
Process Data	8

KINGSTON TOWNSHIP FLOW CHART



DESIGN DATA

PROJECT NAME Kingston Twp WPCP
PROJECT NO. 2-0098-61

TREATMENT Activated Sludge
DESIGN FLOW 0.83 mgd
DESIGN POPULATION 10,000
BOD - Raw Sewage 210 mg/l
SS - - Raw Sewage 250 mg/l

PRIMARY TREATMENT

Comminution

Type: C. P. Barminutor
Size: One Model C (18')

Sewage Lift Pumps

Type: Weinman Type VBM
Size: Two 1200 gpm @ 35' tdh

Grit Removal

Type: Aerated; grit removed by air lift
Size: 1920 gal
Retention: 2 min

Primary Sedimentation

Type: Falk
Size: Two 46' x 12' x 7'7" deep
(8,380 cu ft or 52,200 gal)
Retention: 1.5 hours
Loading: Surface, 750 gal/ft²/day
Weir, 8,600 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air; Two-pass
Size: One tank 62' x 22.5' x 15'
(each pass) (41,900 cu ft
or 262,000 gal)
Retention: 7.6 hours

Air Supply

Type: Roots-Connersville
Size: Two 880 scfm

Diffusers

Type: C. P. Discfuser
Space: 63 diffusers per pass
(wide band)

Secondary Sedimentation

Type: Falk
Size: Two 56' x 12' x 9' deep
(12,100 cu ft or 75,600 gal)
Retention: 2.2 hours
Loading: Surface, 562 gal/ft²/day
Weir, 5,050 gal/ft/day

CHLORINATION

One W & T (100 lb/day)

Chlorine Contact Chamber

Size: One 27' 9" x 9' x 8' deep
(10,300 gal)
Retention: 18 min

OUTFALL

3,000 ft to Lake Ontario

SLUDGE HANDLING

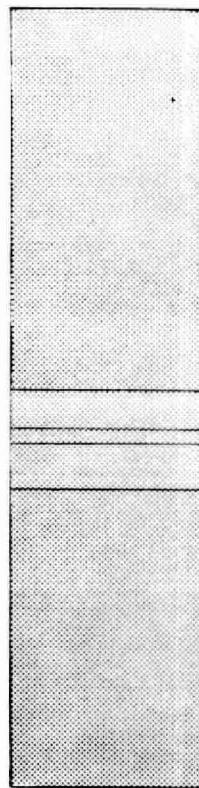
Digestion System

Type: Single stage, mixed by sludge recirculation
Size: One 55' dia x 20' swd
(54,500 cu ft or 340,000 gal)
Loading: 0.57 lb/cu ft/mo
Recirculation pump - one Weinman:
150 gpm @ 65'

Sludge Drying Beds

Four 80' x 20' (6,400 sq ft)

ANNUAL COSTS



1974 OPERATING COSTS

- SALARIES & WAGES 48 %
- EMPLOYEE BENEFITS 5 %
- TRANSPORTATION & COMMUNICATIONS 2 %
- SERVICES 6 %
- SUPPLIES & EQUIPMENT 39 %
- AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS
- TRANSFER PAYMENTS
- OTHER TRANSACTIONS

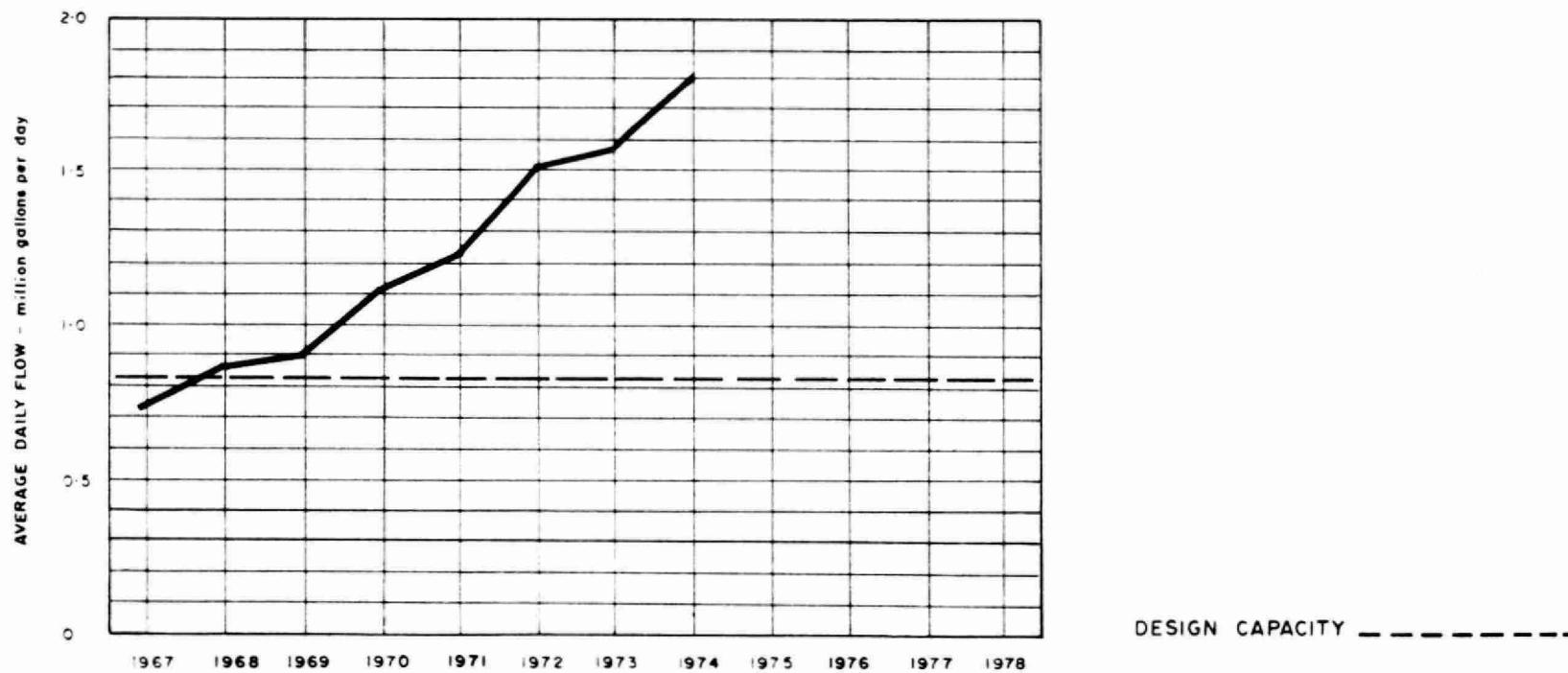
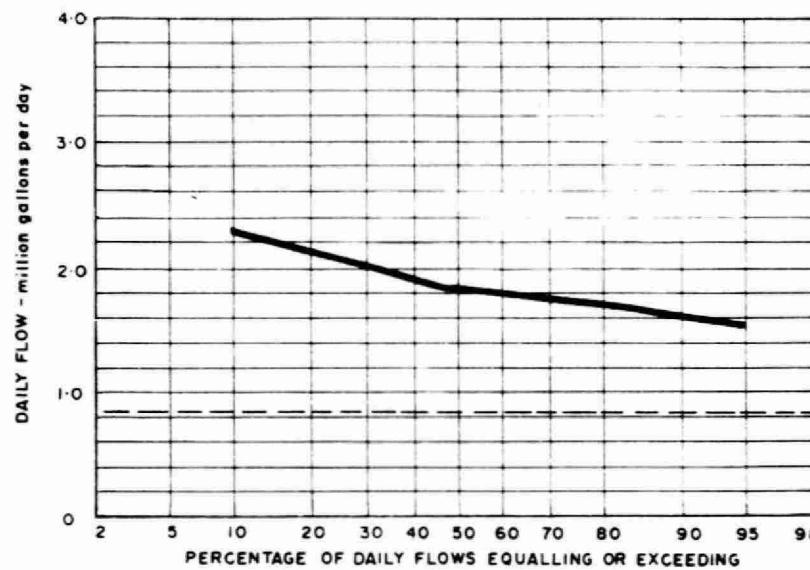
YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M G	¢/lb BOD
1969	345	39,254	114	3
1970	408	44,857	110	7
1971	454	51,491	113	8
1972	549	64,452	117	5
1973	569	60,020	105	2
1974	672	75,876	113	6

OPERATING EXPENDITURES

Regular Staff	\$ 34,814	\$
Casual (Unclassified) Staff	<u>1,491</u>	
TOTAL SALARIES AND WAGES		<u>36,305</u>
TOTAL EMPLOYEE BENEFITS		<u>3,560</u>
TOTAL TRANSPORTATION AND COMMUNICATIONS		<u>1,825</u>
Insurance	<u>1,500</u>	
Sludge Haulage	<u>322</u>	
Repairs and Maintenance	<u>2,895</u>	
Other Services	<u>171</u>	
TOTAL SERVICES		<u>4,888</u>
Machinery and Equipment	<u>4,970</u>	
Chemicals	<u>5,731</u>	
Utilities	<u>16,091</u>	
Other Supplies and Equipment	<u>2,506</u>	
TOTAL SUPPLIES AND EQUIPMENT		<u>29,298</u>
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		
TOTAL TRANSFER PAYMENTS		
OTHER TRANSACTIONS		
GRAND TOTAL	GRAND TOTAL	\$ 75,876

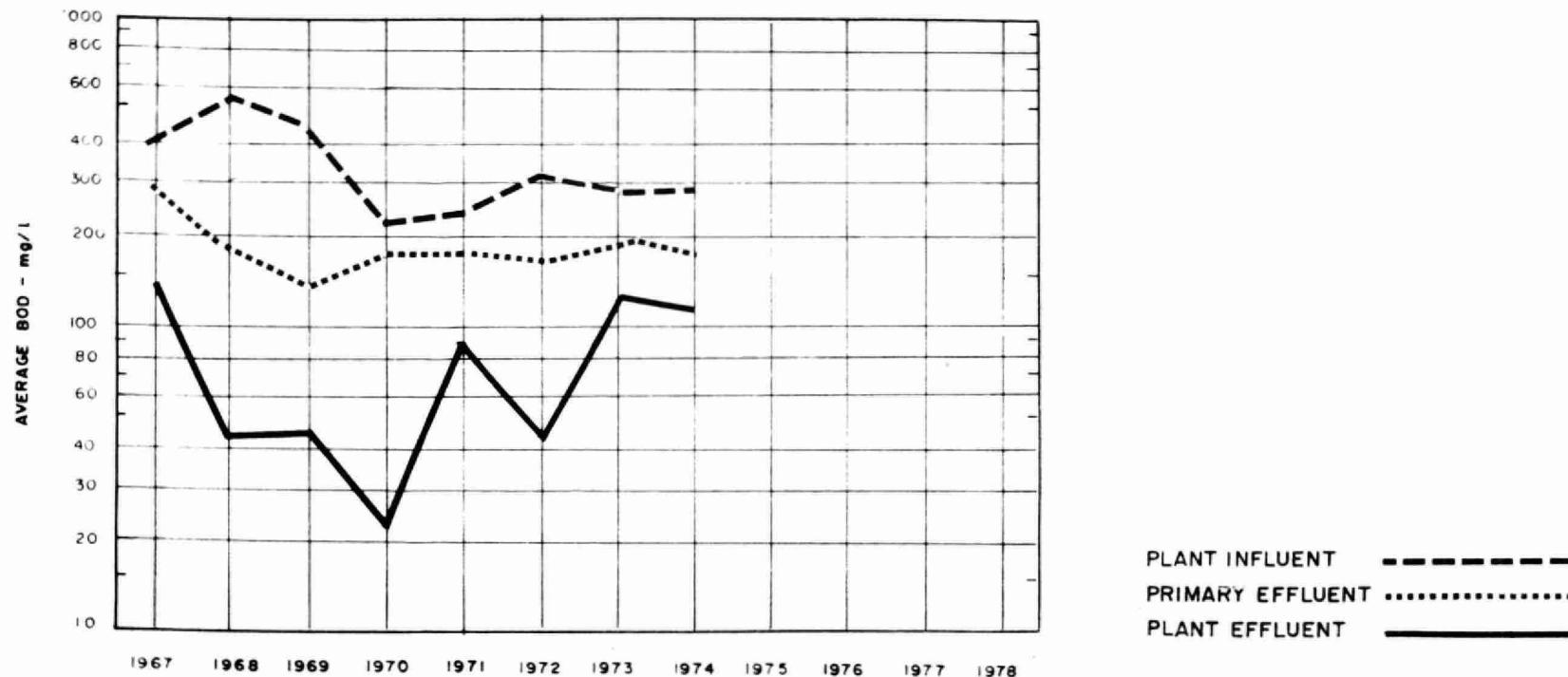
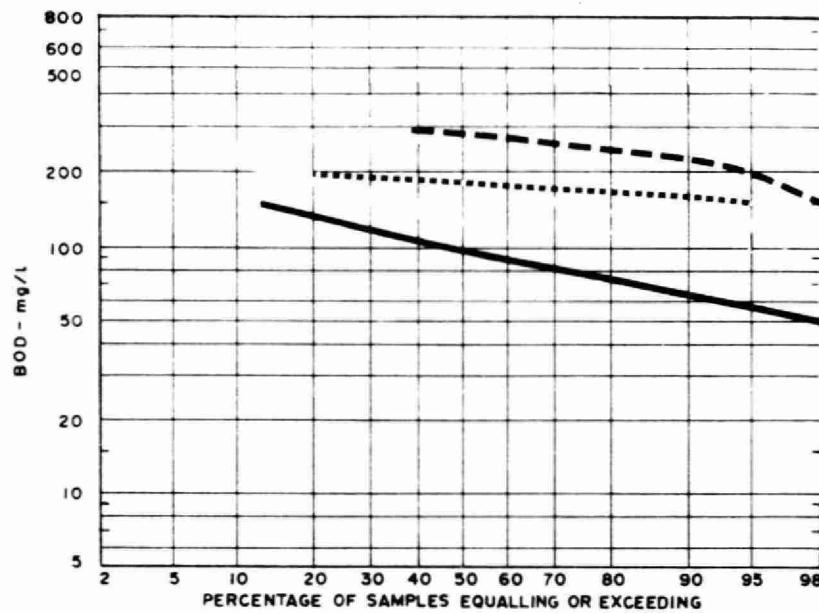
PROCESS DATA FLOWS



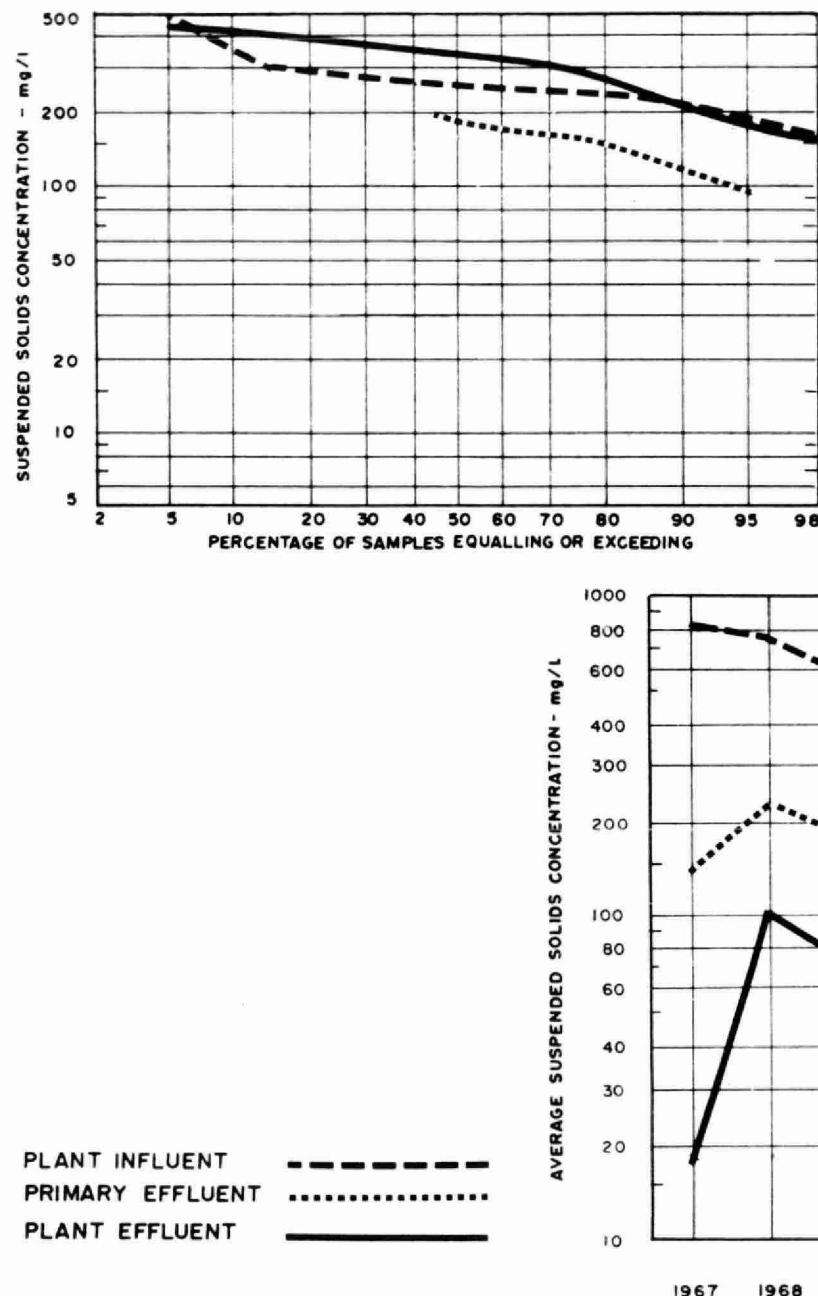
PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 ³ pounds			%	10 ³ pounds		
JAN	56.48	1.82	2.40	316	120	62	111	247	101	59	82	4.2	3.2
FEB	45.89	1.64	2.28	321	105	67	99	253	84	67	78		
MAR	55.43	1.79	2.36	257	80	69	98	219	73	67	81	4.9	3.1
APR	59.31	1.98	2.40	255	106	58	88	255	83	67	102	5.2	3.0
MAY	55.90	1.80	2.36	110	70	36	22	70	60	14	6	3.2	2.0
JUNE	55.12	1.84	2.12	265	114	57	83	247	109	56	76	3.6	5.5
JULY	52.24	1.69	1.89	276	96	65	94	275	85	69	99	9.0	5.8
AUG	51.04	1.65	1.89	284	90	68	99	300	86	71	109		
SEPT	55.06	1.84	2.17	279	102	63	97	355	103	71	139	4.2	6.8
OCT	61.38	1.98	2.23	275	139	49	83	294	115	61	110	7.9	5.0
NOV	62.91	2.10	2.41	224	85	62	87	253	72	72	114	3.9	2.2
DEC	61.79	1.99	2.38	255	99	61	96	270	95	65	108		
TOTAL	672.55	-	-	-	-	-	1184	-	-	-	1197	-	-
AVG.		1.84	MAXIMUM 2.41	288	112	61	99	271	93	66	100	5.6	4.2
No. of Samples	-	-	-	49	49	-	-	52	52	-	-	11	11

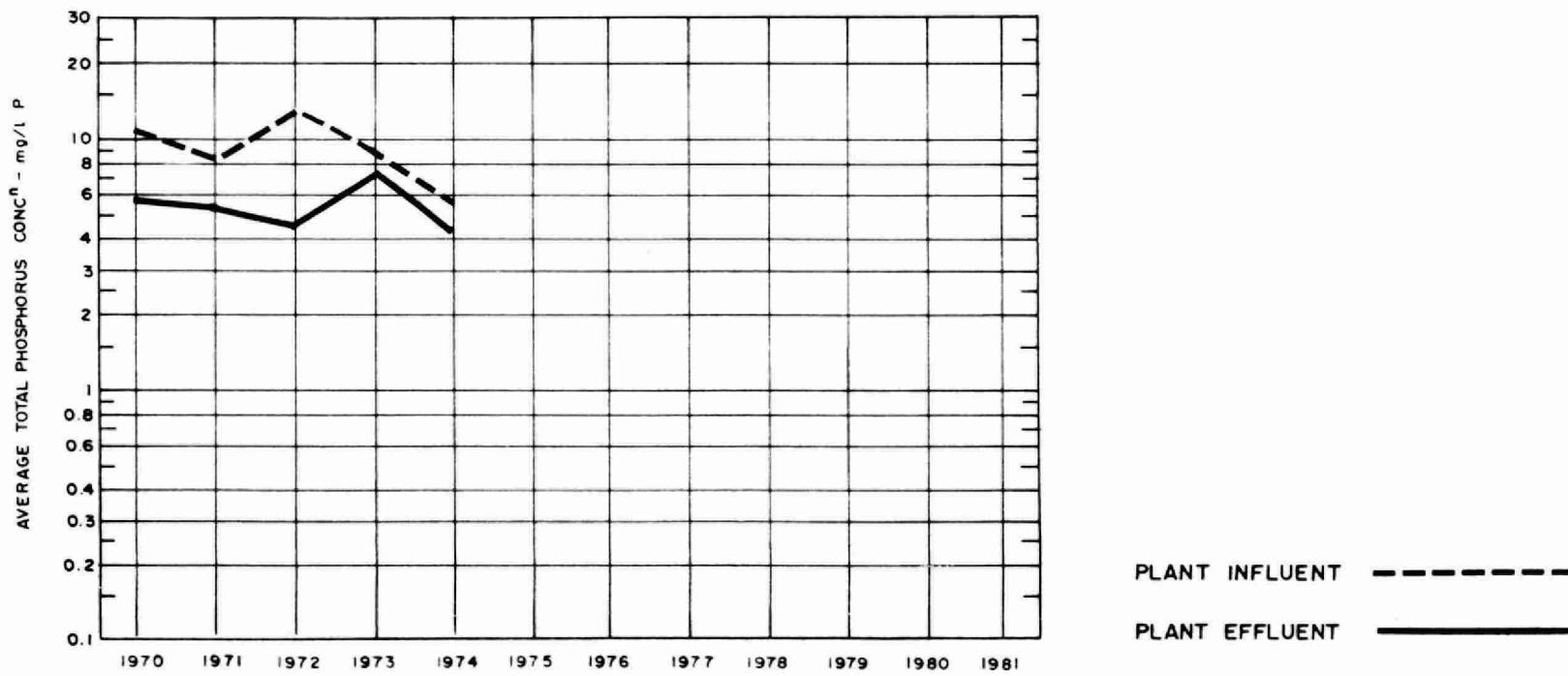
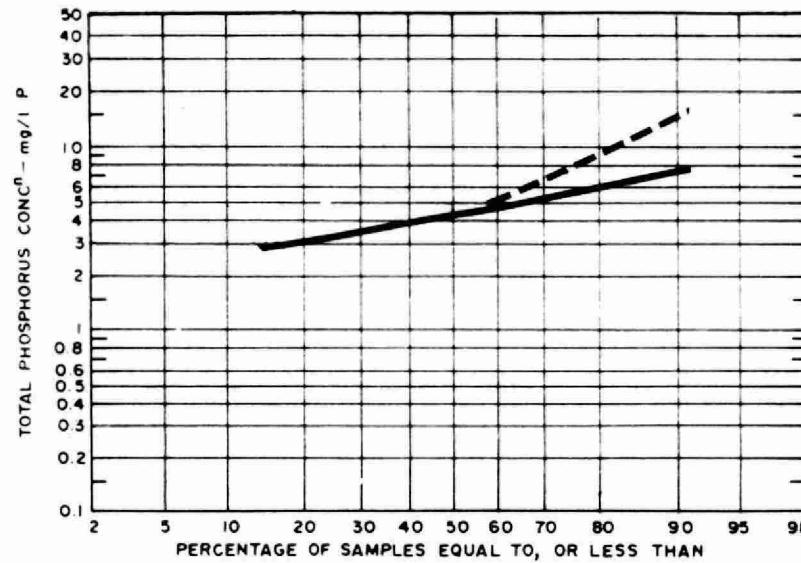
BIOCHEMICAL OXYGEN DEMAND



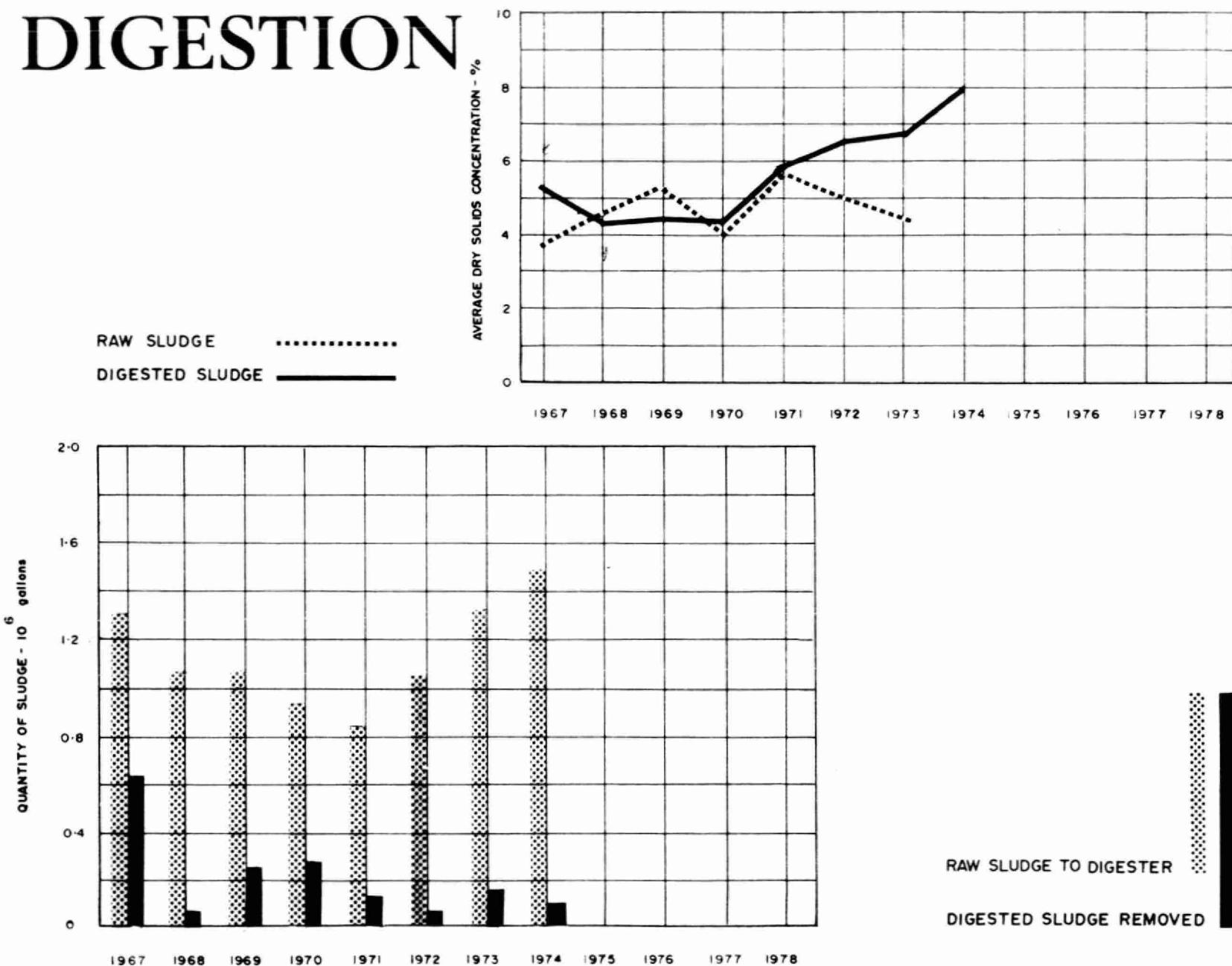
SUSPENDED SOLIDS



PHOSPHORUS



DIGESTION



TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL								
		QUANTITY REMOVED	CL ₂ USED	Avg. DOSE	BOD	SUSPENDED SOLIDS	MLSS CONC	F/M	AIR	RAW SLUDGE		DIGESTED SLUDGE		SUPER-NATANT	AMOUNT HAULED		
		cubic feet	10 ³ pounds	mg/l	mg/l	mg/l	mg/l	day ⁻¹	1000 ft ³ lb BOD	10 ³ gallons	Total SOLIDS %	VOL. SOLIDS %	10 ³ gallons	Total SOLIDS %	VOL. SOLIDS %	T.S. %	cubic yards
JAN	50	2.3	4.2		211	183	2000	.22	.8	134			10	8.0		.07	
FEB	55	1.8	4.2		212	168	1600	.27	.9	111			10				.04
MAR		1.9	3.5		171	177	2200	.16	.8	133							.08
APR	60	1.2	2.2		178	190	2300	.17	1.0	126			10				.08
MAY	30	1.8	3.3		118	70	1800	.25	.7	121			6				.20
JUNE	25	1.2	2.9		184	162	900	.78	.4	118			18				.03
JULY	30	1.7	3.2		186	179	2100	.19	.8	123			10				
AUG		1.8	3.6		165	218	1800	.21	1.2	134			20				.10
SEPT	30	1.5	2.7		167	186	1500	.44	.5	102							.20
OCT	30	1.3	2.7		177	175	2500	.30	.5	135							
NOV	30	.9	1.4		100	75	1500	.30		127			10				
DEC	55	1.3	2.2				1800			123							
TOTAL	395	18.7	-	-	-	-	-	-	-	1487	-	-	94	-	-	-	
AVG.	.6 cu. ft./mil gal	1.6	2.8		181	177	1800	.30	.8	123			12	8.0		.10	

LABORATORY LIBRARY



96936000118762

Date Due

TD/227/K56/K56/1974/MOE
Ontario Ministry of the En
Township of Kingston
water pollution control atgm
plant: operating...c.1 a aa

Environment Ontario



Laboratory Library
125 Resources Rd.
Etobicoke, Ontario M9P 3V6
Canada

PRINTED IN CANADA